DXHeaterPSReplacementPro3.doc 10/5/05

Introduction:

Please wear safety glasses while following this procedure.

This procedure describes how to replace a DX heater power supply or the AGS cold snake Quench Heater power supply with the spare units in 1007W.

The Dx heater power supplies are in the RHIC service buildings 1002B, 1004B, 1006B, 1008B, 1010A and 1012A. They are in racks near the valve boxes.

The quench heaters are only in the A18 house for the AGS cold snake.

A Quench heater power supply is the same as a Dx heater power supply.

The spare units have potentiometers on the front of them so the regulate voltage can be adjusted to match the regulate voltage of the units being removed and replaced.

Table 1 lists the rack names that contain the Dx heater p.s.'s and
Table 2 shows potentiometer settings that correspond to different regulate voltages.
Figure 1 is a photo of one of the Dx heater power supply racks in 1004B.
Figure 2 is a photo of one of the Quench Heater power supply rack in A18.

Procedure:

1) This procedure should be followed while you are in contact with one the RHIC ps group engineers.
2) Go to 1007W and pick up the spare dx heater power supply module you need. There should be 2 up there. These are different than the ones you are replacing because the spares have pots on the front.
3) Bring the spare dx heater power from 1007W to the building you are working in.
4) You should be in contact with one of the RHIC p.s. group engineers at this point.
5) There are 4 dx heater p.s's modules in one rack in the RHIC service buildings.
6) There are 2 Quench Heater power supplies in the rack in the A18 house.
7) The engineer shall send an OFF command to all of the dx heater power supplies in the rack you will be working in.
8) Watch the Bank Discharged LED after the OFF command is issued.
    a. If you find the dx heater p.s. is already OFF and the Bank Discharged LED is OFF this is probably still ok. Look at the DVM display on the front. If it reads less than 20V or so this means the unit is discharged and it is ok to work on. The reason the Bank Discharge LED is not lit is because the OFF command was probably issued a long time ago and the unit charges up a little from just sitting there
9) Once the bank discharged LED comes on, or if the DVM reads 20V or less, you can start to swap out the module.
10) Open up the rear door of the rack.

11) Unplug the ac cord of the dx heater power supply you will be swapping out.
12) Pull out the dx heater power supply module from the front of the rack. The chassis stays in the rack. Just the module slides out.
13) Notice the connectors on the rear of the module. These plug into the chassis.
14) Install the new dx heater power supply from the front of the rack. Make sure it plugs in well.
15) Look at the label on the dx heater power supply that is being replaced. There should be a Ready Voltage indicated by “RDY” and a Regulate Voltage indicated by “REG”.
16) You want to set up the spare dx heater power supply to match the Regulate Voltage.
17) Look at Table 2 at the end of this procedure. The first column has Regulate Voltage. The second column is the Potentiometer setting that you must set the potentiometer to for the regulate voltage you want.
18) If the exact regulate voltage you need is not listed on the table it is very important that you pick a regulate voltage on the table that is lower than the regulate voltage you want and then set the potentiometer to that lower regulate voltage.
19) For example, if the dx heater p.s. you are removing has a regulate voltage of 300V, you would look at the table and choose the pot setting of 9.3 which corresponds to 297V.
20) While the ac cord is still unplugged to the dx heater p.s. you can now adjust the potentiometer to correspond to your regulate voltage.
21) Now plug in the ac cord and close the rear door.
22) Now tell the RHIC ps group engineer to turn on the dx heater p.s. Once the engineer sends the ON command you can watch the dx heater power supply voltage charge up on the LCD display.
23) For a setting of 300V you probably would have set the POT to 9.3. this is an example.
24) Once the charging of the power supply is done you will probably see the LCD display reads somewhere around 295V to 297V for a setting of 9.3 on the Pot.
25) You can now adjust the POT up a little further to give you 300V.
26) When you adjust the pot you must tweak it up VERY, VERY SLOWLY IN VERY, VERY SMALL INCREMENTS. You should be watching the LCD display as you are slowly bringing the pot up.
27) You don’t want to overshoot because it will take a very, very long time for the voltage to come back down. If you get to 1V below the regulate voltage you want then you can stop and that would be close enough.

See next page for tables

TABLE 1

RHIC service buildings Dx heater power supply rack names

RHIC Service Building	Rack Name
1002B	R2BDXHTR
1004B	R4BDXHTR
1006B	R6BDXHTR
1008B	R8BDXHTR
1010A	R10ADXHTR
1012A	R12ADXHTR

In the RHIC service buildinsg the Dx hetaer power supply racks are located near the valve boxes.

See the next page for the AGS cold snake Quench Heater power supply rack location and layout.

AGS Quench Heater rack:

When you go into the A18 house there will be 3 power supply racks that are together in a row. Rack 3 is the one that contains the AGS cold snake Quench heaters. See the layout of the racks below. Also see Figure 2 at the end of this procedure.

RackLayout.skf
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Rack 1	Rack 2	Rack 3
1u spacer	1u spacer	Permit Bypass Chassis (To Node Card Port 1) (2u)
AC Compartment 5u	AC Compartment 5u	Timing Resolver 3u
Iso Amp Chassis 3u	Energy Extraction Resistor for 50v 400A p.s. 6u	QPAIC (To Node Card Port 2) 3u J1A=t1-qp, J1B=tq-qp J2A=csnk-sol-qp, J4A=csnk-qp
4 Channel Ground Current Monitoring Chassis 3u		VT Patch Panel 7u
A20-CSNK-SOL-QP Modified RHIC Snake QPA for 15v 440A p.s. AGS Cold Snake QPA Type 8A 8u	**A20-CSNK-QP** Modified RHIC Snake QPA for 50v 400A p.s. AGS Cold Snake QPA Type 8B 8u	Quench Detector 9u
Dummy QPA's Box (2u) **A20-csnk-t1-qp & A20-csnk-t2-qp**	1u spacer	
○ 1 2u spacer Trim RC Box Panel 2 ○	50v 400A p.s. 6u	
15v 440A p.s. 3u		Lead Heater 3u
1u spacer	1u spacer	1u spacer
A20-CSNK-SOL-PS 3u control chassis (To Node Card Port 5) 5u	**A20-CSNK-PS** 3u control chassis (To Node Card Port 6) 5u	Permit Link Fan in Fan out Chassis 2u
		Quench Heater Interface Chassis (J1 Port 3 and J2 to Port 4) 2u
1u spacer	1u spacer	**A20-QH-HTA** (J1 here to J6 of QHIC) Quench Heater ps #1 6u / **A20-QH-HTB** (J2 here to J5 of QHIC) Quench Heater ps #2 6u
A20-CSNK-T1-PS 50A Corrector p.s. TRIM 1 (To Node Card Port 7) 3u	**A20-CSNK-T2-PS** 50A Corrector p.s. TRIM 2 (To Node Card port 8) 3u	
Controls Fiber Optic Interface Card Bucket (6u) Slot 1=t1-ps, Slot 2=t2-ps Slot 3=csnk-sol-ps Slot 4=csnk-ps	1u spacer	1u blank panel
	Node Card (address 9) 9 ports used (1-8 & 12) Permit on port 12 (3u)	UPS 5u
1u spacer	3u spacer (extra long node card cables) AGS Permit Interface Box	

The red arrow indicates the location of the quench heater power supplies.

Table 2 Regulate Voltage and Potentiometer Settings.

Regulate Voltage (V)	Potentiometer Setting
206	8.1
212	8.2
217	8.3
223	8.4
230	8.5
236	8.6
244	8.7
252	8.8
261	8.9
269	9
277	9.1
286	9.2
297	9.3
308	9.4
320	9.5
335	9.6
351	9.7
366	9.8
383	9.9
403	10

Figure 1 - Photo of one of the Dx heater power supply racks in 1004B.

The red arrows indicate the location of the dx heater power supplies.

Figure 2 - Photo of the Quench Heater power supplies in rack 3 in the A18 house.

The red arrow indicates the location of the quench heater power supplies. The chassis was removed for this photo because we were working on it.